

CLAIMS

What is claimed is:

- 1 1. A method of coating a substrate, comprising:
2 providing a substrate having a surface;
3 forming a polymeric layer on the surface of the substrate by applying
4 a layer of a polymeric precursor to at least a portion of the surface;
5 polymerizing the polymeric precursor to form a polymerized layer; and
6 applying a metal coating to at least a portion of the polymerized layer;
7 wherein the metal coating is applied under sub-atmospheric conditions.

- 1 2. The method of claim 1, wherein the step of applying the layer of the
2 polymeric precursor is performed using an electrophoresis process.

- 1 3. The method of claim 2, wherein the step of forming the polymerized
2 layer includes elevating the temperature of the polymeric precursor to a temperature
3 of at least about 320°F.

- 1 4. The method of claim 2, wherein the polymeric precursor is selected
2 from the group consisting of acrylics, epoxies, urethanes, and combinations thereof.

- 1 5. The method of claim 1, wherein the substrate is porous, and further
2 comprising leveling the surface of the substrate before the step of applying the metal
3 coating.

- 1 6. The method of claim 5, wherein the metal coating is applied using a
2 physical vapor deposition method.

1 7. The method of claim 6, further comprising the step of removing a
2 portion of the polymerized layer before applying the metallic coating.

1 8. The method of claim 7, further comprising cleaning at least the
2 polymerized layer before the step of removing a portion of the polymerized layer.

1 9. The method of claim 6, wherein the metal coating is applied in a
2 pressure range of about 5×10^{-4} millitorr to about 2×10^{-5} millitorr.

1 10. The method of claim 6, wherein the metal coating is applied by
2 evaporation.

1 11. The method of claim 3, further comprising maintaining the polymeric
2 precursor at the temperature for at least about 12 minutes.

1 12. A method of coating a surface, comprising:
2 providing a substrate;
3 coating at least a portion of the substrate with a layer of an
4 electrophoretically applied polymeric precursor;
5 polymerizing the polymeric precursor to form a first polymeric coating;
6 and
7 elevating the temperature of the polymeric coating to at least about
8 400°F for at least about 6 minutes.

1 13. The method of claim 12, further comprising applying a layer of metal
2 over at least a portion of the polymeric coating.

1 14. The method of claim 13, further comprising applying a second
2 polymeric coating over the layer of metal.

1 15. A method comprising:

2 forming a polymeric coating from an electrophoretically applied
3 polymeric precursor and applying a layer of metal over the polymeric coating using
4 a physical vapor deposition process.

1 16. An article having a porous surface, comprising:

2 an electrophoretically applied first polymeric layer overlaying and in
3 direct contact with the porous surface; and
4 a metallic layer overlaying the first polymeric layer.

1 17. The article of claim 16, further comprising:

2 a second electrophoretically applied polymeric layer overlaying and in
3 direct contact with the metallic layer.

1 18. The article of claim 16, wherein the article is selected from the group
2 consisting of plumbing fixtures, jewelry, and utensils.

1 19. The article of claim 17, wherein the article is selected from the group
2 consisting of plumbing fixtures, jewelry, and utensils.

1 20. The article of claim 16, wherein the polymeric layer is a dielectric
2 layer.

1 21. The article of claim 16, wherein the metallic layer is chrome.

1 22. The article of claim 16, wherein the first polymeric layer has a
2 thickness ranging from about 1 millimeter to about 40 millimeters.

23. The article of claim 16, wherein the metal layer has a thickness ranging from about 0.1 millimeter to about 3 millimeters.

1 24. The article of claim 23, wherein the second polymeric layer has a
2 thickness ranging from about 1 millimeter to about 40 millimeters.

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